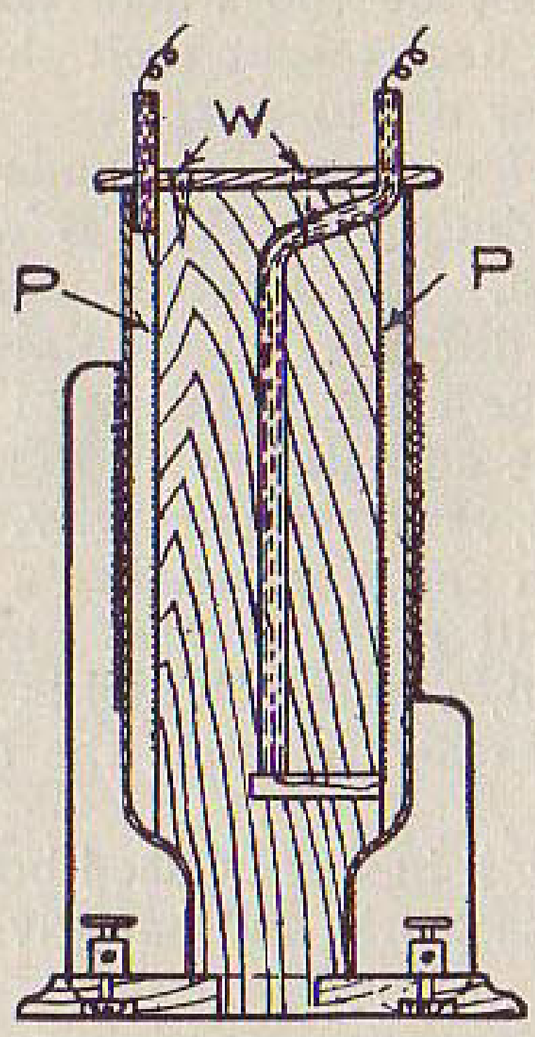
A TESLA DISRUPTIVE COIL.

By C. Clarence Whittaker.

The "Tesla" disruptive coil is a coil which increases both the tension and the frequency of the current of an ordinary induction coil. In the larger coils of this kind all insulating parts are made of hard rubber and the whole coil is immersed in paraffine or transformer oil.

In the coil which I will will here describe, hard rubber and oil will be replaced by glass and paraffine respect-

ively, as these are the next best substitutes. Fig. 1 shows a vertical cross section of this coil. The primary coil consists of about twenty-five turns of large rubber-covered wire, such as flexible lamp cord, wound in one layer. It is wound on a glass gas lamp chimney. The tube on to which the secondary is wound is made of some hard wood such as maple. It is highly important that this should be entirely free from all moisture. After it has been turned to the



-FIG. 1-

proper dimensions it must be dried in a hot oven, after which it should be thoroughly soaked in boiling paraffine. This will render it entirely impervious to moisture. The secondary is wound on to this and consists of one layer of No. 32 or 33 D. C. C. copper wire. The ends of this layer should extend about an inch beyond those of the primary layer. It will be seen from the illustration that the relative position of the secondary and primary coils is the reverse of

that in an induction coil; that is, the secondary lies within the primary. The upper terminal of the secondary is brought directly to the top through a glass tube; the lower terminal, on account of the great difference of potential existing between these two ends, must be brought to the top by leading it through another glass tube, which has been fitted to a hole drilled lengthwise in the wooden form and to a shallow slot nearly perpendicular to this hole.

The base is attached to the hard-wood form, as shown in illustration, and contains two binding posts to which are led the terminals of the primary.

The whole coil should now be warmed so that when the molten paraffine P is poured between the outer glass and the secondary, no fractures will occur. Enough paraffine must be poured in to completely fill the glass. After this has cooled, a thin wooden top, previously boiled in paraffine, may be fitted around the terminal tubes and attached to the hard-wood form by means of wooden plugs W W. These secondary terminals should be situated as far distant as possible, as the brush discharge from this current is very marked. The connections are shown in Fig. A, B, C, page 38.

The primary of this coil may be thought of as analogous to the antennae of a wireless station which is transmitting, and the secondary as analogous to one receiving. In regarding the coil in this light, the value of condensers coupled to the spark of the transmitting apparatus in wireless telegraphy is clearly shown by the following: When the condenser C is not used with the coil, only a small current is noticeable at the disruptive terminals; but when the condenser is attached, as in Fig. A, B, C, a multitude of high tension discharges occur.

However paradoxical it may seem that this disruptive discharge is of so high a tension and frequency that no perceptible shock can be obtained from it, it

is nevertheless true. The slight burning sensation which is experienced when the current is passed through the body when contact is made with the bare hands vanishes when contact is made with metallic objects held firmly in the hands, on account of the greater surface offered by these electrodes.

With this current, exhausted tubes may be made to glow brightly, but differently from those operated by an ordinary induction coil. Both terminals in the tube exhibit the same brightness on account of the condenser in the circuit, which tends to make each alternation of the current of equal moment.

AIR-INSULATED TESLA COILS.

A Tesla coil suitable for use with spark coils of from 2 to 6″ spark, with air as an insulator, may be made as follows: On a paper tube 3″ in diameter and 11″ long, wind 1 layer of No. 31 B. & S. enamel wire.

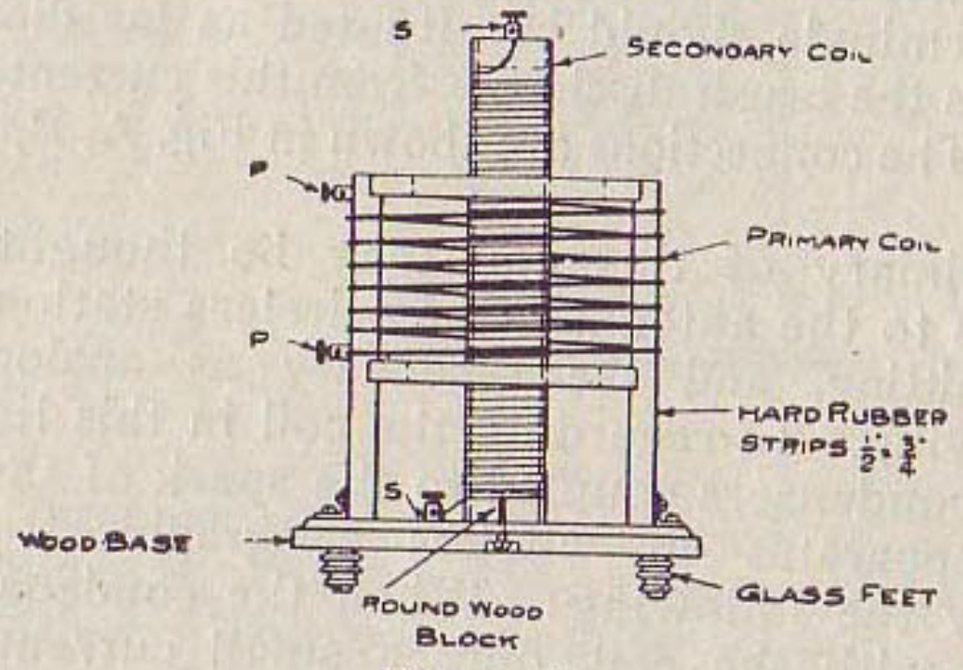


Figure 1

This is the secondary and is supported as shown in Fig. 1.

The primary is formed of 20 turns No. 14 B. & S. solid or better stranded copper wire, rubber covered,

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